

HEARING SCREENING PROTOCOL COMPARISON

FOR PRESCHOOLERS, TODDLERS, AND INFANTS

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Introduction

- What are hearing screenings?
- Why are they important?
- What are hearing screening tools?

Introduction

- Purpose of hearing screenings:
 - Identify individuals who are likely to have a hearing loss
 - Refer to an audiologist for further diagnostic testing

Introduction

- Hearing screening importance:
 - Early identification and intervention
 - Auditory, speech, language, and socio-emotional development

(Eiserman, Shisler, Foust, Buhrmann, Winston, & White, 2008)

Introduction

- Unmanaged hearing loss:
 - Causes deficits in key developmental processes
 - Speech and/or language disorders, feelings of isolation, academic difficulties

Early Hearing Detection and Intervention (EHDI) Programs

- Established in every state/territory in US
- Newborn hearing screenings
 - Identify hearing loss at birth

What about progressive and acquired hearing loss?

(White, 2008)

Progressive and Acquired Hearing Loss

- 20% of childhood hearing loss
- Increases need for hearing screenings later in childhood

(Georgalas, Xenellis, Davilis, Tzangaroulakis, & Ferekidis, 2008)

Importance of hearing screening

- Identify children with hearing loss early to improve developmental outcomes
- Sensitivity and specificity
- Referral to audiologist

(Smiley, Shapley, Eckl, & Nicholson, 2012)

Hearing screening tools

- Transient evoked otoacoustic emissions (TEOAEs)
- Otoscopy
- Immittance testing
- Pure-tone screening

Purpose of this research

- Compare two hearing screening protocols
 - Protocol #1: TEOAEs
 - Protocol #2: TEOAEs, otoscopy, immittance testing, and pure-tone screening

Methods

- Secondary data analysis:
 - EHDI program
 - Hearing screening forms

Methods

- Participants
 - 709 infant, toddler, and preschool children
 - Albany County, Wyoming

Methods

- Procedures:
 - De-identified forms
 - Computerized using dual data entry procedure
 - Discrepancy resolution

Analysis

- SPSS 22 (2013)
 - Descriptive statistics and frequency data
 - 2 x 2 contingency table
 - Pearson chi-square

Results

Figure 1. Crosstabulation of screening protocols

		TEOAE only		Total
		Pass	Fail	
Overall screening	Pass	753	0	753
	Fail	4	96	100
Total		757	96	853

- 88% passed both screening protocols
- 11% failed both screening protocols
- 0.4% passed TEOAE and failed screening battery
- 0% passed screening battery and failed TEOAE

Results

- Pearson Chi-square
 - [$\chi^2 (1, N=853) = 814.6; p=.0005$]
 - No statistically significant difference between the two hearing screening protocols

Discussion

- TEOAEs
 - Time-effective screening measure compared to complete screening battery

Discussion

- Influencing factors:
 - Background noise, middle ear pathology
- Limiting factors:
 - Analysis of written records
 - Geography and training of screeners

Discussion

- Future research
 - Children who were unable to be screened
 - Ages of children receiving TEOAEs versus pure-tones
 - Examining rescreens and medical follow-ups

Conclusion

- Hearing screening protocols
 - crucial for identification and intervention of hearing loss in children
- TEOAEs may be an effective hearing screening protocol compared to complete screening battery
- More research is needed

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